

This listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims:**

Claim 1 (previously presented): A heat generation process with reduced emissions of oxides of sulphur in which:

- a) a sulphur-containing fuel is burned in a combustion zone comprising a heat exchange zone in which at least a portion of the heat is extracted, and effluents or combustion fumes are recovered at a temperature in the range 800°C to 1200°C;
- b) the fumes resulting from said combustion, charged with oxides of sulphur, are caused to traverse a space for supplying and distributing the fumes to a desulphurisation apparatus functioning with an internal recycle of a solid oxides of sulphur adsorbent;
- c) the adsorbent is injected into said space;
- d) the fumes are caused to enter said apparatus;
- e) the fumes are caused to penetrate into a convection exchange zone and at least a portion of the heat is extracted from said fumes;
- f) the mixture resulting from steps b) and c) is separated in a gas/solid separation zone and a portion of the gaseous effluent that has been freed of the major portion of the oxides of sulphur and at least partially cooled is evacuated, and said adsorbent particles comprising said sulphur-containing compounds are evacuated, wherein said desulphurization apparatus comprises a peripheral zone for recycling adsorbent, an intermediate desulphurization zone into which fumes enter tangentially, and a central zone for evacuating fumes.

Claim 2 (previously cancelled)

Claim 3 (previously presented): A process according to claim 1, further comprising after step f), regenerating at least a portion of said adsorbent particles comprising said sulphur-containing

compounds and re-injecting the resultant regenerated adsorbent particles into the space acting to supply the desulphurisation apparatus.

**Claim 4 (previously presented):** A process according to claim 1, wherein a calcitic adsorbent is used and desulphurisation is conducted at a mean temperature in the range of 800°C to 1110°C.

**Claim 5 (previously presented):** A process according to claim 1, wherein a regeneratable magnesian adsorbent is used and desulphurisation is conducted at a mean temperature in the range of 700°C to 1000°C.

**Claim 6 (previously presented):** A process according to claim 1, wherein after combustion step a), the fumes traverse one or more superheated steam bundles.

**Claim 7 (previously presented):** A process according to claim 1, operated at adsorbent flow rates such that the concentration of solids in the fumes, except for the recycle, is in the range 0.1 to 1000 g/Nm<sup>3</sup>.

**Claim 8 (previously presented):** A process according to claim 1, operated with a gas recycle ratio in the apparatus in the range of 1% to 50%.

**Claim 9 (previously presented):** A process according to claim 8, wherein the adsorbent recycle ratio is in the range of 1 to 50.

**Claim 10 (previously presented):** A process according to claim 1, wherein the grain size of the adsorbents is in the range of 0.1 to 1000 microns.

**Claim 11 (previously presented):** A process according to claim 1, wherein the adsorbent particles have a density in the range of 100 to 5000 kg/m<sup>3</sup>.

Claim 12 (previously presented): A process according to claim 1, operated at adsorbent flow rates such that the concentration of solids in the fumes, except for the recycle, is in the range 1.0 to 100 g/Nm<sup>3</sup>.

Claim 13 (previously presented): A process according to claim 1, operated with a gas recycle ratio in the apparatus in the range of 10% to 50%.

Claim 14 (previously presented): A process according to claim 13, wherein the adsorbent recycle ratio is in the range of 2 to 10.

Claim 15 (previously presented): A process according to claim 1, wherein the grain size of the adsorbents is in the range of 5 to 100 microns.

Claim 16 (previously presented): A process according to claim 1, wherein the adsorbent particles have a density in the range of 1000 to 2500 kg/m<sup>3</sup>.

Claim 17 (previously presented): A process according to claim 1, wherein  
said process is operated at adsorbent flow rates whereby the concentration of solids in the fumes, except for the recycle, is in the range 0.1 to 1000 g/Nm<sup>3</sup>,  
said process is operated with a gas recycle ratio in the apparatus in the range of 1% to 50%,  
wherein the adsorbent recycle ratio is in the range of 1 to 50,  
wherein the grain size of the adsorbents is in the range of 0.1 to 1000 microns, and  
wherein the adsorbent particles have a density in the range of 100 to 5000 kg/m<sup>3</sup>.

Claim 18 (previously presented): A process according to claim 1, wherein  
said process is operated at adsorbent flow rates whereby the concentration of solids in the fumes, except for the recycle, is in the range 1 to 100 g/Nm<sup>3</sup>,

said process is operated with a gas recycle ratio in the apparatus in the range of 10% to 50%,

wherein the adsorbent recycle ratio is in the range of 2 to 10,

wherein the grain size of the adsorbents is in the range of 5 to 50 microns, and

wherein the adsorbent particles have a density in the range of 1000 to 2500 kg/m<sup>3</sup>.

Claim 19 (previously presented): A process according to claim 1, further comprising after step f), regenerating at least a portion of said adsorbent particles comprising said sulphur-containing compounds and re-injecting the resultant regenerated adsorbent particles into the space acting to supply the desulphurisation apparatus, and  
after combustion step a), the fumes traverse one or more superheated steam bundles.

Claim 20 (previously presented): A process according to claim 17, further comprising after step f), regenerating at least a portion of said adsorbent particles comprising said sulphur-containing compounds and re-injecting the resultant regenerated adsorbent particles into the space acting to supply the desulphurisation apparatus, and  
after combustion step a), the fumes traverse one or more superheated steam bundles.

Claim 21 (previously presented): A process according to claim 18, further comprising after step f), regenerating at least a portion of said adsorbent particles comprising said sulphur-containing compounds and re-injecting the resultant regenerated adsorbent particles into the space acting to supply the desulphurisation apparatus, and  
after combustion step a), the fumes traverse one or more superheated steam bundles.

Claim 22 (new): A process according to claim 1, wherein said desulfurization apparatus is substantially cylindrical, and wherein said peripheral zone, intermediate desulfurization zone and central zone comprises three at least partially concentric zones.

**Claim 23 (new): A process according to claim 22, wherein said intermediate desulfurization zone is substantially vertical and said fumes entering tangentially into said intermediate desulfurization zone are caused to enter said intermediate desulfurization zone at least partially at a lower part of said desulfurization zone.**